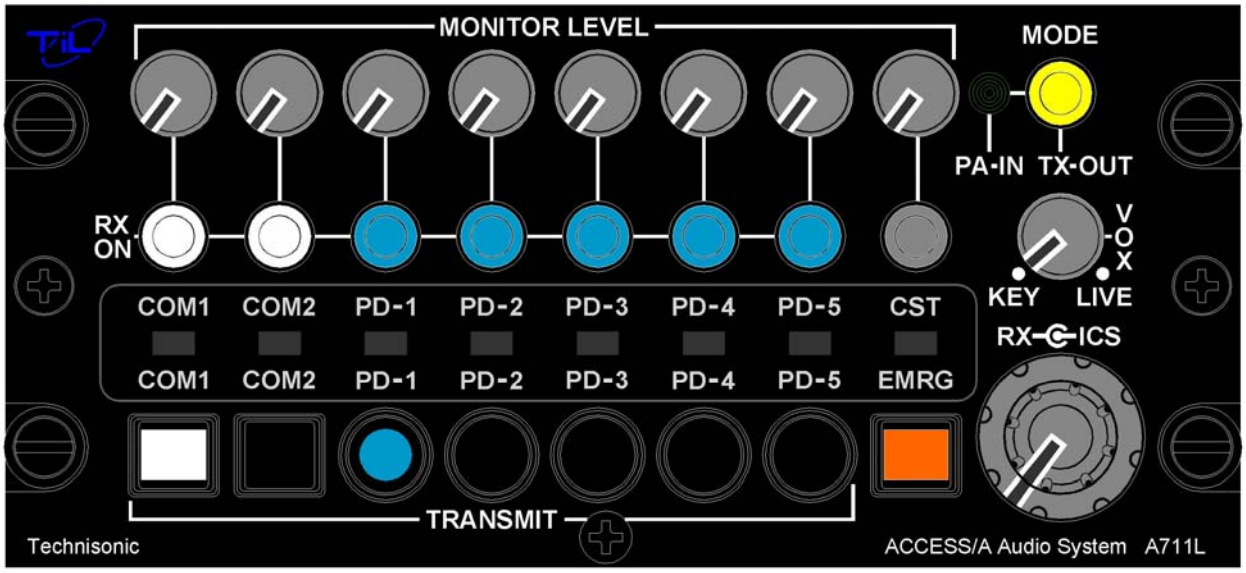
ACCESS/A™ AUDIO CONTROL SYSTEM
MODEL: A711 L-Series



Installation Manual

TiL Document No.
09RE416
Rev. A
May, 2012

Technisonic Industries Limited

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REVISIONS				
Revision	**Page**	**Description**	**Date**	**Approved**
A	2-11	Fig. 2-9 Updated for PA Pin corrections	May 22, 2012	WS2/SM
A	2-19	Installation drawing corrected for PA pins	May 22, 2012	WS2/SM
A	2-20	Fig. 2-13 Connector Map corrected for PA	May 22, 2012	WS2/SM

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☑CAUTION

This unit contains **static sensitive devices**. Wear a grounded wrist strap and work at a static-safe workstation when handling internal printed circuit boards.

☑WARRANTY INFORMATION

The Model A711L Audio Controller is under warranty for one year from date of purchase. Failed units caused by defective parts or workmanship should be returned for warranty service to:

Technisonic Industries Limited
240 Traders Boulevard
Mississauga, Ontario L4Z 1W7

Tel: (905) 890-2113
Fax: (905) 890-5338

☑TRADEMARK INFORMATION

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SECTION 1

GENERAL DESCRIPTION

1.1 INTRODUCTION

This publication provides operating and installation information on the Model **A711 L-series, ACCESS/A** Audio Controls manufactured by Technisonic Industries Limited. For convenience, it is referred to as the "**A711L**" in the manual. This unit is designed to provide high performance cockpit audio control in high noise installations. The unit is plug and pin compatible with the **ACCESS/A** family format, to allow fleet wide compatibility with all **ACCESS/A** installations, ***with the following limitations***: The **A711L** has its ***extra functions*** assigned to the "Alerting" connector, and can also have 3-tone alerting as an internal option. These connections are slightly different than a standard A710/711 unit, and to prevent any airframe problems, the alerting connector has different locks on the A711L, to make it impossible to connect it to an airframe wired for default A710/711 functions. If an existing installation had no alerting connector wiring, then it can be used without difficulty, but note the installation issues regarding annunciator dimming. **The A711L comes ONLY in a 28V panel backlight configuration.**

1.2 DESCRIPTION

This high power audio controller delivers at least 332 mW of audio into 150 ohms at less than 2% total distortion to the pilot and co-pilot positions simultaneously. It can deliver lower output powers into 300 and 600 ohm headsets. The pilot's position may also be internally strapped to interface with 8-20 ohm headsets at the same power level. Push-button transmit selector switches allow immediate selection of any of the seven supported aircraft communications transceivers and a PA amplifiers, while additional push-button audio input selector switches allow selection of any or all of the supported transceiver's receive audio lines. In addition, a switched (and adjustable) input is provided for special functions such as Cross-Sidetone (CST), a Nav Aid, or a Music feed. **ACCESS/A** systems have ***auto-RX switching*** when a transmitter is selected, to reduce pilot workload and avoid operational problems.

The **A711L** has front panel selectable and adjustable **VOX**, **LIVE** or **KEYED** intercom (ICS) functions. An **EMERGENCY** mode push-button switch (switch and LED turn red-orange when activated) provides "straight through" or "fail-passive" transmit and receive audio for the pilot on the ***selected communications channel***. This switch also provides an implicit pilot **ISOLATION** function, and allows the pilot to isolate himself from the co-pilot (and the ICS system), so that he may access different communications from the other users supported by this panel (in essence, an emergency link to the selected transceiver only). In the **NORMAL** position (switch turns black & LED green), the pilot's audio is provided as selected by all of the panel controls, and is part of the ICS system. Separate **RX** and **ICS volume controls** are provided on the panel along with an **ICS VOX threshold control**. These units can also provide ICS support and boom mic TX support for a complete aircraft crew, including the pilot, co-pilot, and up to 4-6 additional passengers.

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1.3 PURPOSE OF THE EQUIPMENT

The **A711L ACCESS/A** Audio Controls are designed to provide centralized audio management and control within an airborne communications environment. This includes radio and transceiver selection, intercom, airframe threat alerting, and crew management. These units have been packaged to minimize size and weight characteristics and are ideally suited for helicopter installations, or any other Dzus rail panel location. The A711L meets all of the current requirements of US Forest Service "contractor furnished avionics" and can be used in a dual control installation in conjunction with a TiL FM airborne transceiver to comply with all US Forest Service Contract Requirements. These products are also compliant with **TSO-C50c.** The units were tested according to **RTCA/DO-214** and **RTCA/DO-160C** applicable categories with the exception of the RF Susceptibility Test, which is based upon the requirements of **RTCA/DO-160A**, and the Lightning Induced Transient Susceptibility Test which is not called out under **RTCA/DO-170.**

1.4 MODEL VARIATION

The A711L comes in two basic lighting configurations, all with +28VDC panel lighting, a regular version and an NVG optimized panel lighting version. Operationally the two are identical, but the NVG panel is set to a lower intensity range and has a different optical wavelength. The color of the regular solid-state backlighting is “White”, the NVG is “Verde” centered at a 505nm wavelength. Panel front color is matte black, and the lighted knobs can be in several formats. The default knob style is all black, except the two ICS knobs (VOX and level), which are gray for easy identification. Units may also be supplied with or without internal 3-tone alerting (w/ground-seeking keylines). See the ACCESS/A price list for model numbers and availability or different versions. All A711 L-series part numbers begin **961072**, followed by a dash number. The most common variations are summarized below:

Dash First Digit	Second Digit	Second Digit
-2 Black w/Gray ICS	0 No Alerting, Direct I/P, CST	1 Full Alerting, CST
-3 Gray w/Black ICS	2 No Alerting, Direct I/P, NAV	3 Full Alerting, NAV
-4 All Black Knobs	4 No Alerting, Direct I/P, AUX	5 Full Alerting, AUX
-5 All Gray Knobs		
-6 Black w/Gray ICS NVG		
-7 Gray w/Black ICS NVG		
-8 All Black Knobs NVG		
-9 All Gray Knobs NVG		

Default configurations shown shaded.

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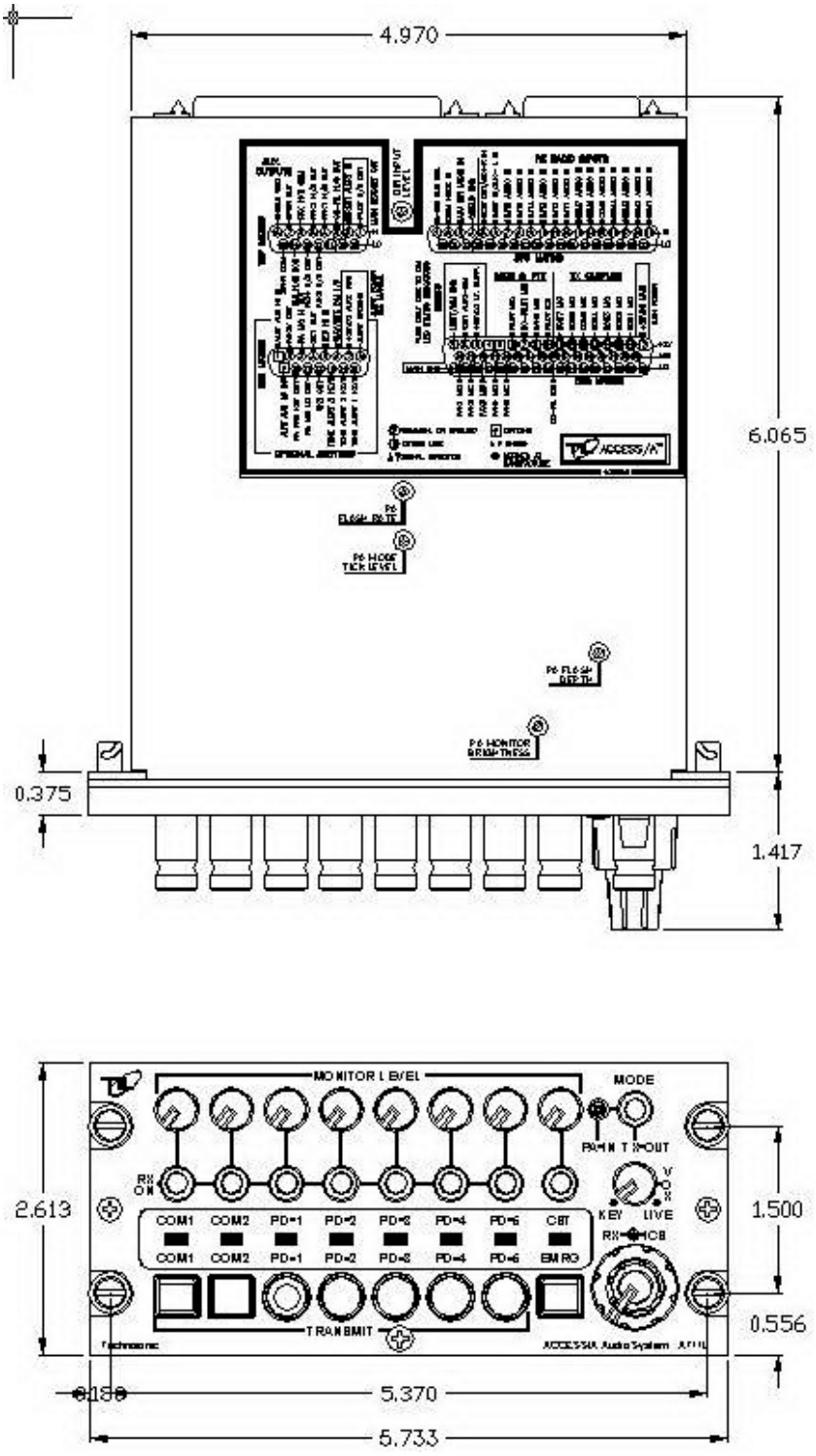


FIGURE 1-2 A711L ACCESS/A AUDIO CONTROLLER - GENERAL VIEW

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1.5 TECHNICAL SUMMARY

A summary of the relevant electrical, operational, mechanical and physical characteristics of the control panels are given in **Table 1-1**, General Specifications.

TABLE 1-1 A711 L-Series GENERAL SPECIFICATIONS

MODEL A711L-Series - ACCESS/A Audio Controller:

PHYSICAL CHARACTERISTICS:

Width (max.)	5.75 inches
Height (max.)	2.625 inches
Depth	6.07 inches
Weight (including alerting)	3.0 lbs. (1.36 Kg)
Mounting	Standard Dzus, 4 fasteners

POWER SOURCE REQUIREMENTS:

DC Voltage (MIN, TYPICAL, MAX)	20.0V, 28 V, 32.2V (System performance will be degraded at upper and lower limits)
DC Current	1 A (6 users @150 Ω, + speaker @8 Ω)
Backlighting Input:	
Standard	28 Vdc @ 200 mA Max.

TECHNICAL CHARACTERISTICS:

Input Impedance (Normal Mode, any RX input)	2K-1.5K Ω (approx.)
Input Impedance (Emergency Mode, Com1-7 RX Inputs)	50 Ω + Headset Z (typical)
Headset Channel Output Impedance	8 or 80 Ω (depending on settings)
H/S Audio Power Output	at least 332 mW (primary user) into 150 Ω with 6 headsets (150 Ω each) connected.
H/S Audio Power Output	at least 500 mW (pilot) into 8-20 Ω
H/S Audio Power Output	at least 1500 mW (total) into 6 users @150 Ω
Speaker Power Output	at least 2.5 W into 8 Ω
Audio distortion (Speaker or H/S)	less than 2% THD @1kHz at total rated output
Audio Frequency Response (ICS)	within 3 dB from 300 Hz to 6000 Hz
Audio Frequency Response (Rx & NAV)	within 3 dB from 300 Hz to 3000 Hz
Hum and Noise Level	better than -60 dB below 500 mW
Input Muting (when mike is keyed)	adjustable
Input to Input isolation	better than -70 dB between inputs
Deselected input isolation	better than -65 dB
CST Input/Output Levels	100-150mV into 150 Ω typical for 100mW H/S power

ENVIRONMENTAL:

Temperature (operating)	-45°C to +70° Celsius
Temperature (survival non-operating)	-55°C to +85° Celsius
Humidity	95% Non-condensing
Shock	12 g (any axis)
Altitude	25,000 feet

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1.6 SYSTEM LIMITATIONS

A summary of the relevant system limitations is given below.

1.6.1 Power Limitations

With Standard Set-up, which consists of six headsets connected, a power output of not less than 332 mW is delivered per headset (as represented by 150 ohms) **provided that the Direct Alert Input is terminated in not less than 600 ohms and that nominal input voltages are applied at the applicable channel inputs.** Nominal microphone input: 100 mV_{rms}; Nominal Communications/Navigational Input: 5.5 V_{rms}.

1.6.2 Frequency Response Limitations

In accordance with the provisions made in RTCA/DO-214 Sections 2.8.1 and 1.5.1 the communications transmit out and receiver channels (communications and navigational) possess an effective bandwidth of 300 Hz--3000 Hz with a maximum amplitude variation of 3 dB within the frequency range.

1.6.3 Crosstalk Limitations

To ensure that the crosstalk specifications are in accordance with the applicable sections of DO-214, it is essential that 1) manufacturer's maximum **microphone input voltage of -4.7 dBu not be exceeded** in order to avoid jeopardising **input to microphone output crosstalk** results, particularly at the low frequency end, 2) in the instance where only two access units are daisy chained via their ICS tie-lines, **a resistor of not greater than 600 ohms must be maintained across the ICS tie-line** in order to avoid jeopardising **station to station** crosstalk results in Rx mode at the high frequency end.

The phenomenon of music appearing at the headset of the Second Station Panel (SSP or unit at which the crosstalk is measured) for station to station crosstalk considerations is a limitation of the A711L and for which crosstalk at high frequencies (6000 Hz and greater) can fall below 65 dB of attenuation. However music for most intents and purposes may be considered an optional feature, which may be turned off without a negative impact on the essential functioning of the access units.

Further, valid station to station crosstalk measurements were quoted in respect of a half power level at the headset at the First Station Panel (FSP or unit from which the crosstalk originates) as opposed to a half power level at the speaker output of the FSP because it is envisioned in the latter scenario that the substantial speaker level (which will also necessitate very large signal levels at the FSP headset) will have an impact on the listener at the SSP whether a crosstalk signal appears at the SSP listener's headset or not.

When multiple transceivers are selected for simulcast operation, they are bound together at the station output, and thus are also bound together for other stations as well, defeating cross-talk measurements. All measurements are based on single transceiver TX selection.

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1.6.4 Isolation Limitations

When in Pilot Isolation Mode, the pilot microphone for ICS operation is rendered inactive. Consequently, neither co-pilot nor passengers can receive pilot intercom transmissions while the latter is in Isolation mode.

1.6.5 Standard Settings Utilised Throughout Testing

Pilot Headset Settings utilized throughout testing was for the standard 150 ohms impedance headset. The PAL options utilized were applicable to the following configuration: Where Pilot or Co-pilot transmitted on the UUT ICS communication was possible only in the instance where the signal emanated from other unit(s) daisy chained to the UUT via the ICS tie-line. In this event the UUT would receive the ICS transmissions from the other unit(s). It was not possible for the UUT, which transmitted, to export ICS communication to another unit nor was it possible for intra ICS communication to occur between users connected to UUT (i.e. Option 1 not implemented).

1.6.6 Transmission Priority

Where Pilot and Co-pilot transmit simultaneously, the Pilot transmissions take precedence over those of the Co-pilot. Co-pilot transmissions in this case would be rendered inactive.

1.6.7 Induced Signal Susceptibility, RF Susceptibility and RF Emission

The wiring connections called out in the Installation and Operating Instructions, chapter 2, describes shield terminations for minimum ground loop noise. The test harnesses used for RTCA/DO-160 sections 19, 20, and 21 – Induced Signal Susceptibility, RF Susceptibility, and Emission of RF Energy respectively - used shield terminations at both ends of the cable. Should RF susceptibility pose a problem in a particular installation the installer may wish to try terminating shields at both ends of the cable, further, if this does not produce satisfactory results then double shielding may be required.

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SECTION 2

INSTALLATION INSTRUCTIONS

2.1 GENERAL

This section contains information and instructions for the correct installation of the **A711 L-Series, ACCESS/A** Audio Controllers. For convenience they are referred to as **A711L** in the manual.

Make certain that the unit is correctly operating in accordance with the equipment user's requirements and manufacturer's specifications, prior to releasing the equipment for service.

2.2 EQUIPMENT PACKING LOG

Unpack the equipment and check for any damage that may have occurred during transit. Save the original shipping container for returns due to damage or warranty claims. Check that each item on the packing slip has been shipped in the container. Verify that the equipment's backlighting configuration is the ***same as that required***.

IMPORTANT! There are ferrite beads on component leads, which can produce a muted rattle when the box is shaken, THIS IS NORMAL, DO NOT BE ALARMED.

2.3 WIRING REQUIREMENTS

Airframe wiring should be single conductor in accordance with MIL-W-22759 or multi-conductor in accordance with MIL-C-27500 or Raychem 44 (81044) or 55 single or multi-conductor and shielded wire. Heat shrink solder sleeves (such as Raychem or equivalent) should be utilized for shield termination.

All Microphone audio input and output line connections should be made with 2 conductor/twisted pair shielded cables as illustrated. Receiver audio input lines should also be 2 conductor twisted pair shielded cables. The power and ground lines should be a minimum of #22 AWG (#20 preferred). Keying and all audio lines may be #24 AWG or larger.

☑ CAUTIONS:

DO NOT bundle ***any low level audio lines with RF coaxial cables, 60 Hz or 400Hz AC inverter, motor, pump or blower wiring***, which can cause noise coupling between the various systems, especially during RF transmission or pump/blower mechanical operation. Maintain as much distance as possible from these types of wire bundles.

Note that there is really **no effective field-installable shielding** for **magnetic coupling** (which occurs at high currents), and the only suitable prevention for this type of interference is **distance** between the interfering lines. Shielded wiring is effective **only** for electrostatic coupling, or voltage driven interference.

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2.4 ACCESS/A AUDIO PANEL INSTALLATION

The **A711L ACCESS/A** Audio Controls are designed to be Dzus mounted and should be installed in conjunction with an **IN-A711L** installation connector kit. See **Figure 2-1** for an outline drawing of the units with dimensions, to facilitate the installation.

☑ CABLE CLEARANCE:

Allow **at least 2.5" of additional rear clearance** for mating connectors and hoods (side routing), or 3.0" (back routing). Cables should be long enough to **permit the unit to be removed** from the panel, and the connectors to be easily disengaged. **DO NOT** dress or strap the mating cables so that front removal is impossible, or the unit cannot be removed for service or adjustment in the field.

☑ ALERT OPERATION:

3 Tone alerting can be supplied with this unit from the factory. Tone frequency and cycle rate, as well as # 3 alert on-time can be adjusted at the rear of the unit. Field installation of the tone option must be done at a **fully equipped service bench**, and requires a system functional test & re-certification.

☑ PANEL MODIFICATIONS:

Modified panel legends, panel lighting and NVG compatibility, or optional functions are also possible; please see the price list for a full summary of options and part numbers. Overlays and legends may be easily changed at low cost in the field with no special tools or service facilities required.

☑ SHIELD GROUNDS:

Convenient **shield ground connections** are provided at each connector for the indicated input signal shield drains, and will give the shortest possible return for these lines. These shield lines should be daisy chained together, and a single wire from each cable brought out to the designated connector pin.

☑ INTERNAL OPTIONS:

All **configurable and variable options** of the A711L (pilot H/S impedance, muting logic, included speaker audio lines, etc.) can be set or changed simply by altering internal jumpers, but these changes ***require opening the unit for access*** to the required connections.

☑ DRAWINGS:

A full **ACCESS/A** (mono) system installation example is given in the multi-page sections of **Figure 2-x.** These installation and mechanical drawings are available as **AutoCAD files** ("DWG"/R12 format, Windows Metafile "WMF" or "DXF" format) free of charge to authorized TiL dealers and completion centres.

☑ WIRING CONCEPT OVERVIEW:

Do NOT connect un-needed radio wiring or alerting triggers to any control, even though it can theoretically operate that radio, as increased cross-talk and possible accidental operation will result. For good spares support, you may want to have all controls the same, but operationally it rarely makes sense in the airframe for everyone to have every signal or radio access. Un-terminated signal inputs pre-wired as spares may become a serious noise source, and are not recommended. You can run spare wiring, but do not connect it to the A711L until used.

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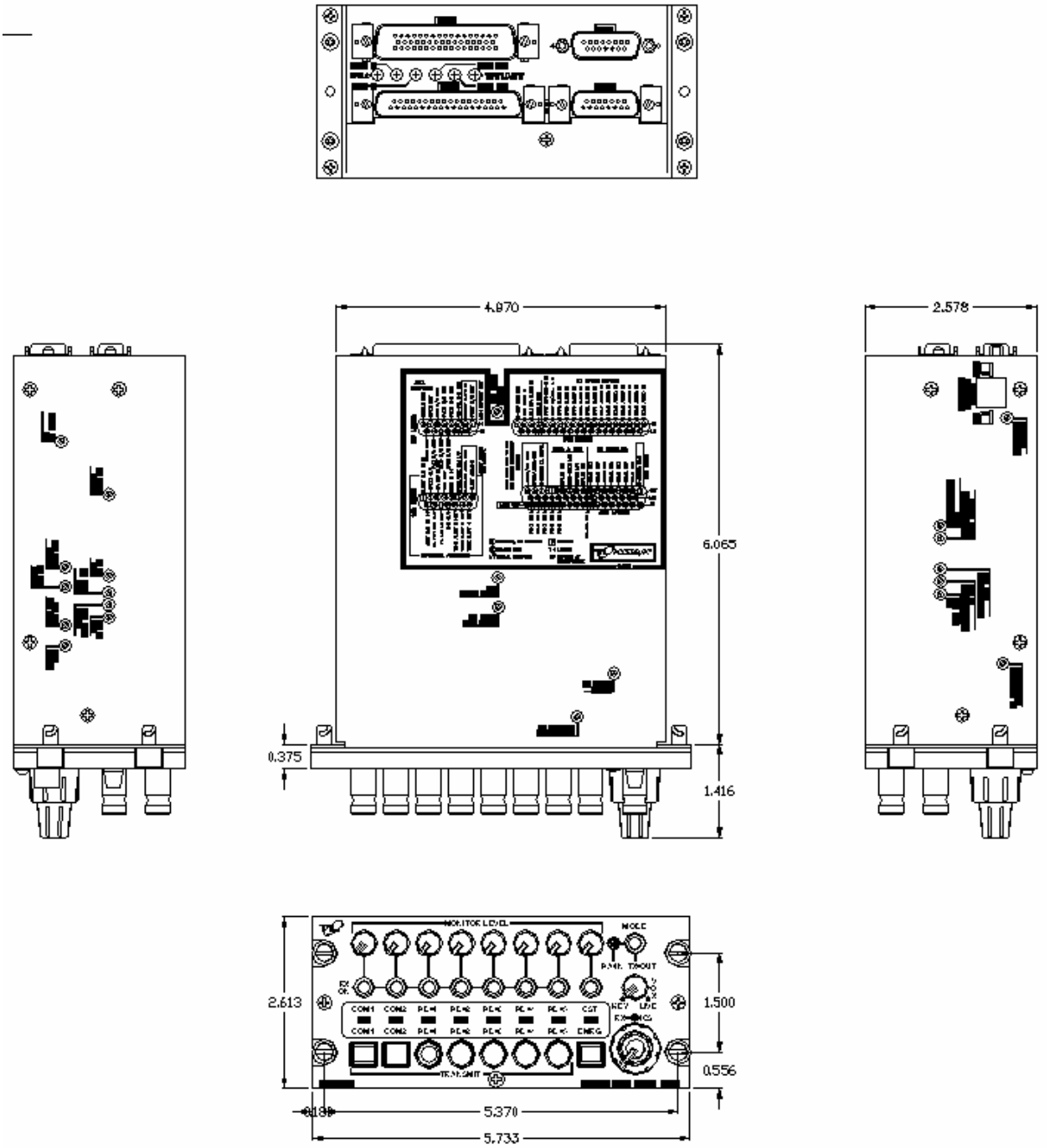
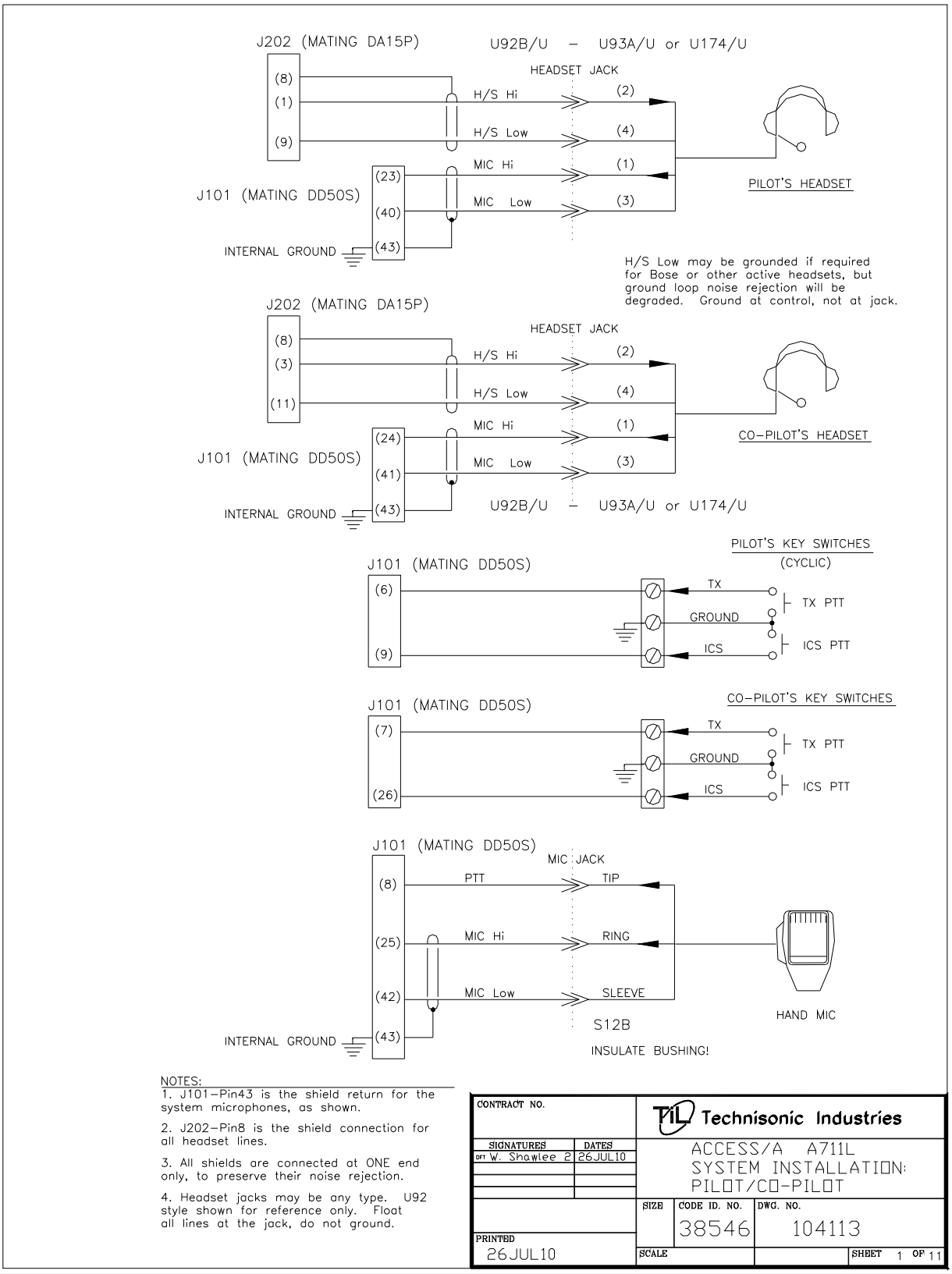


FIGURE 2-1 Outline Drawing for Model A711L ACCESS/A Audio Controller

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NOTES:
1. J101–Pin43 is the shield return for the system microphones, as shown.
2. J202–Pin8 is the shield connection for all headset lines.
3. All shields are connected at ONE end only, to preserve their noise rejection.
4. Headset jacks may be any type. U92 style shown for reference only. Float all lines at the jack, do not ground.

CONTRACT NO.		Technisonic Industries
SIGNATURES	DATES	ACCESS/A A711L SYSTEM INSTALLATION: PILOT/CO-PILOT
DFT W. Shawlee 2	26JUL10	
PRINTED 26JUL10		SIZE: — CODE ID. NO.: 38546 DWG. NO.: 104113
		SCALE: — SHEET 1 OF 11

Figure 2-2 PILOT/CO-PILOT WIRING

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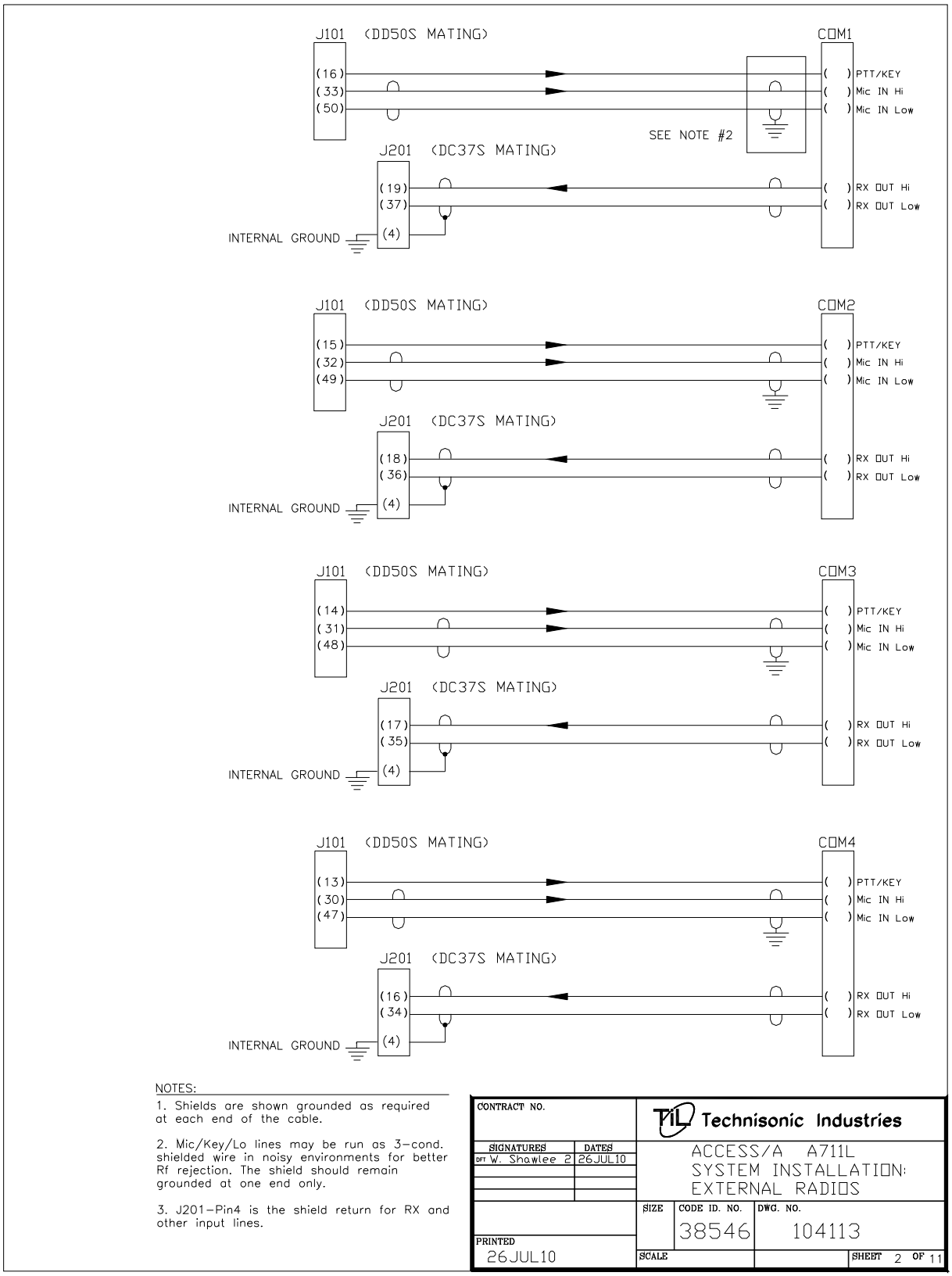


Figure 2-3 COM1-COM4 WIRING

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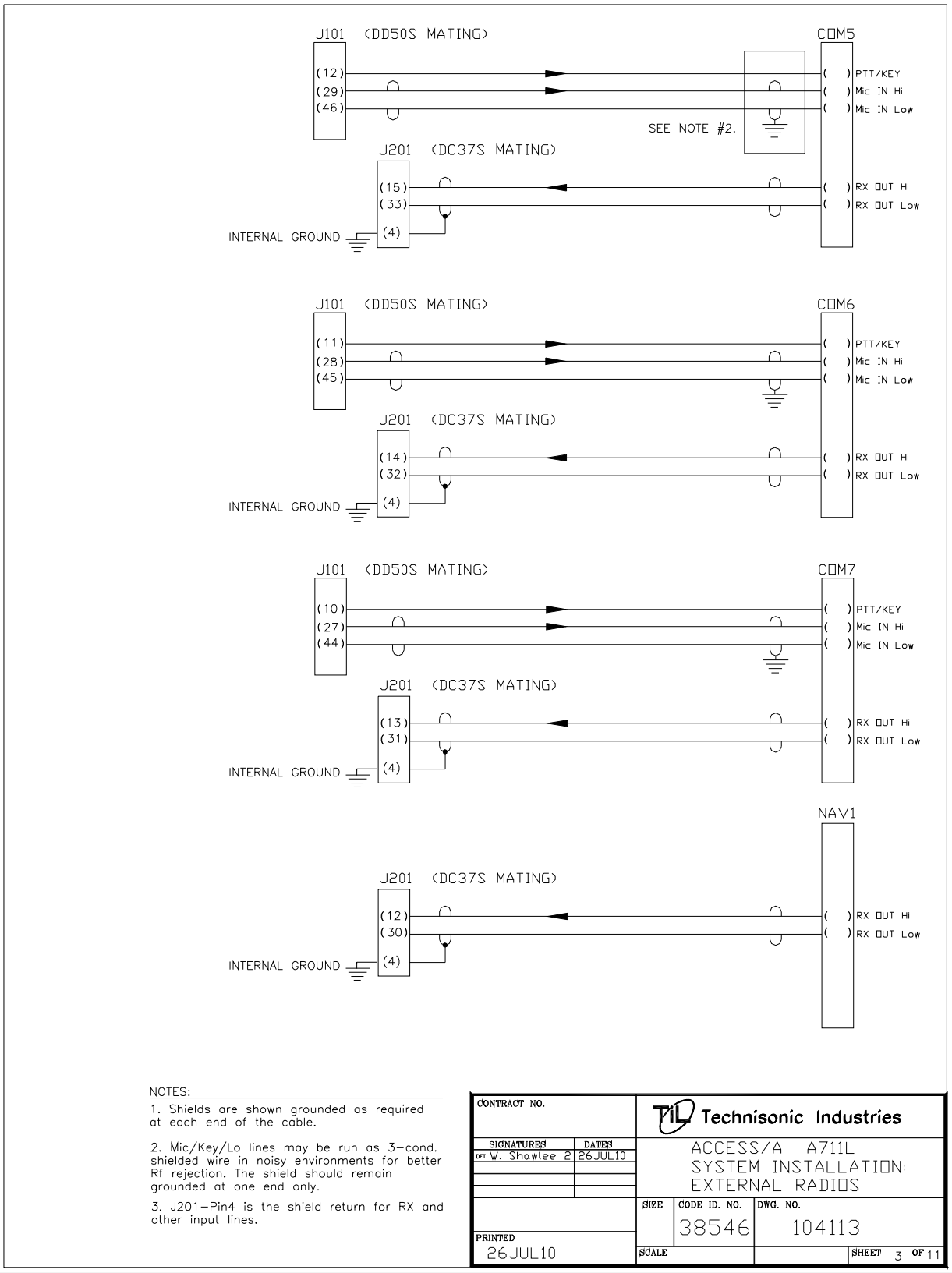


Figure 2-4 COM5-NAV1 WIRING

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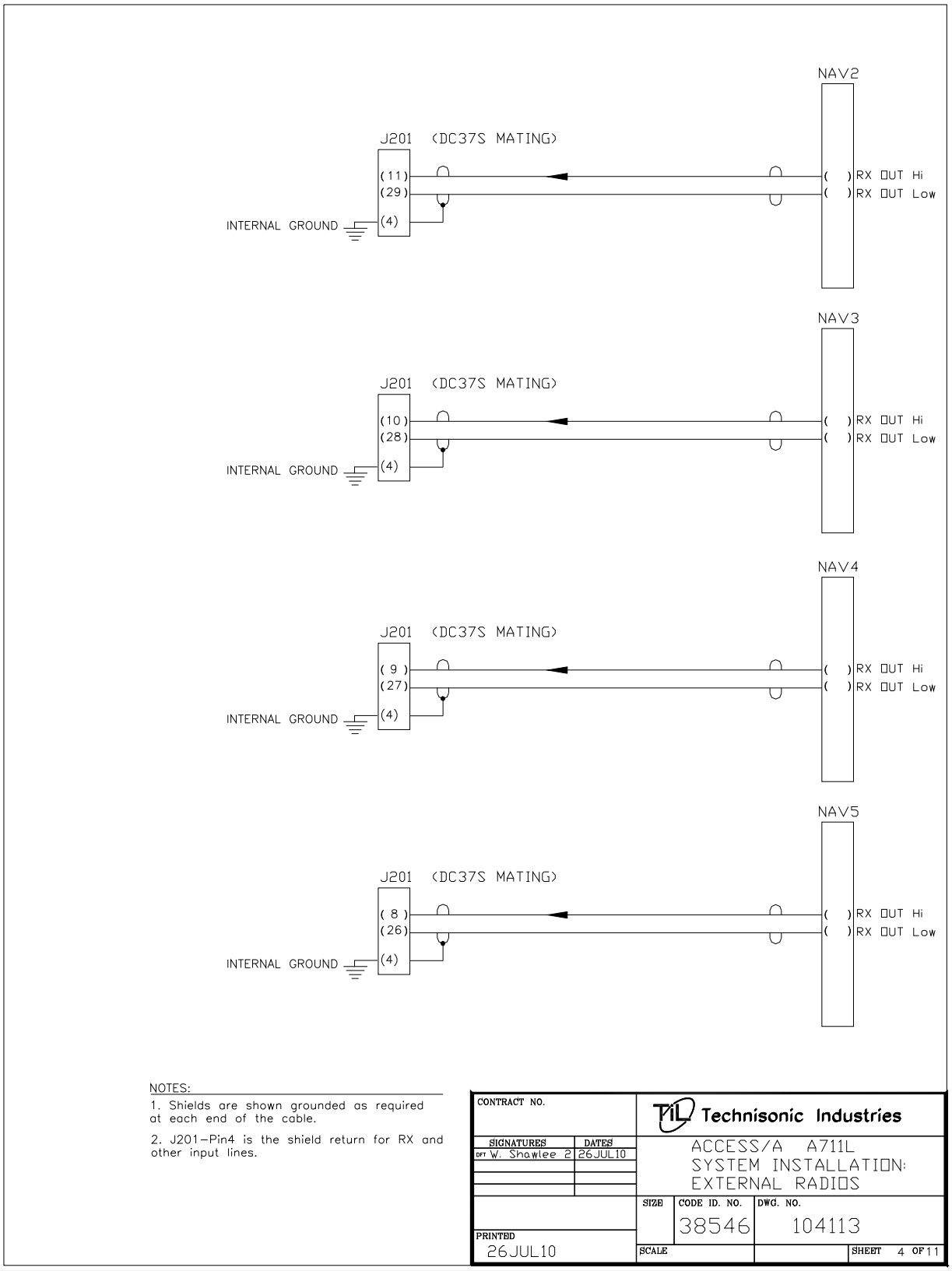
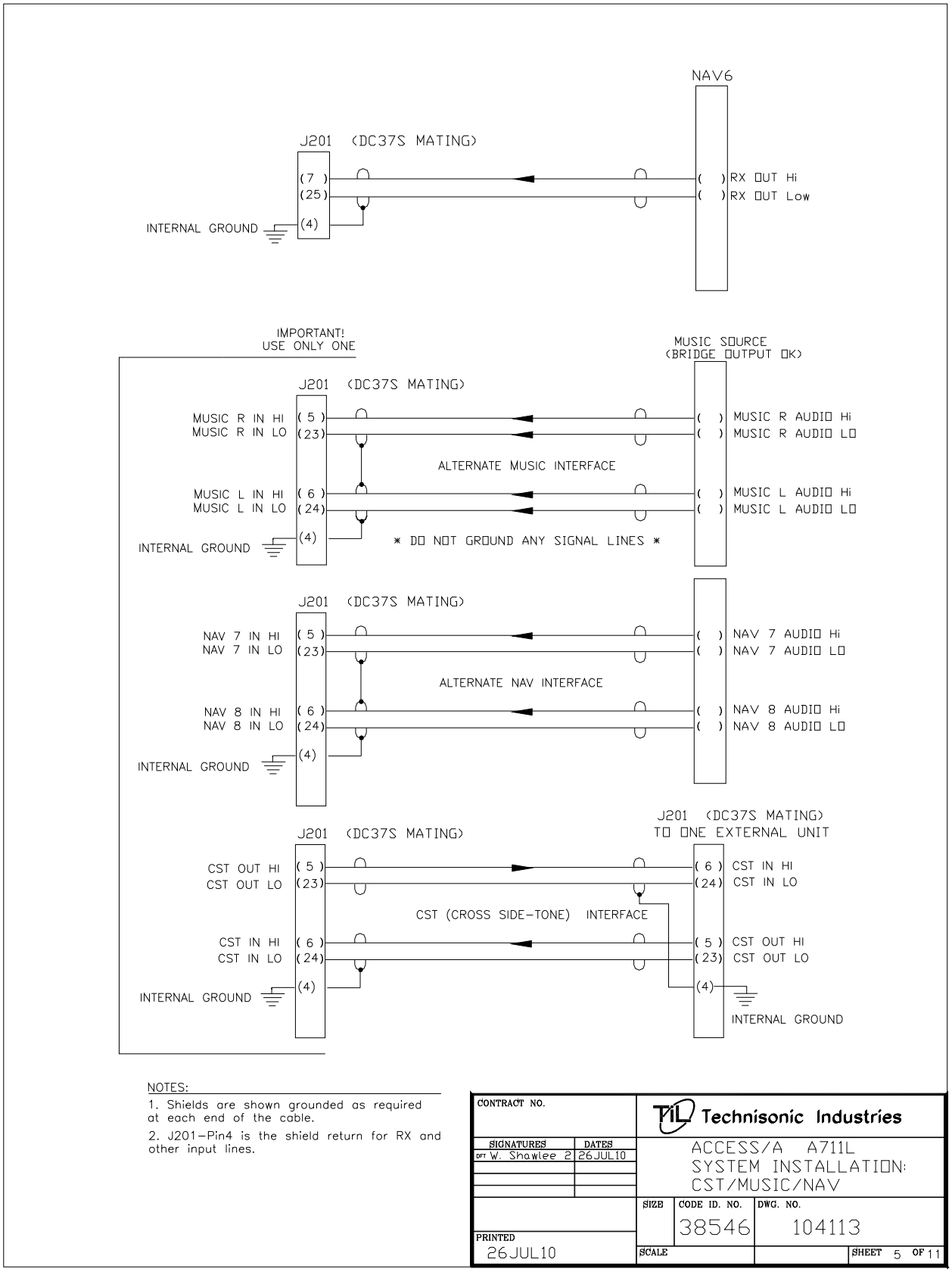


Figure 2-5 NAV2-NAV5 WIRING

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NOTES:

1. Shields are shown grounded as required at each end of the cable.
2. J201–Pin4 is the shield return for RX and other input lines.

CONTRACT NO.	Technisonic Industries
SIGNATURES / DATES: DFT W. Shawlee 2 26JUL10	ACCESS/A A711L SYSTEM INSTALLATION: CST/MUSIC/NAV
PRINTED 26JUL10	SIZE / CODE ID. NO. 38546 / DWG. NO. 104113
	SCALE / SHEET 5 OF 11

Figure 2-6 NAV6-NAV8 / CST / MUSIC WIRING

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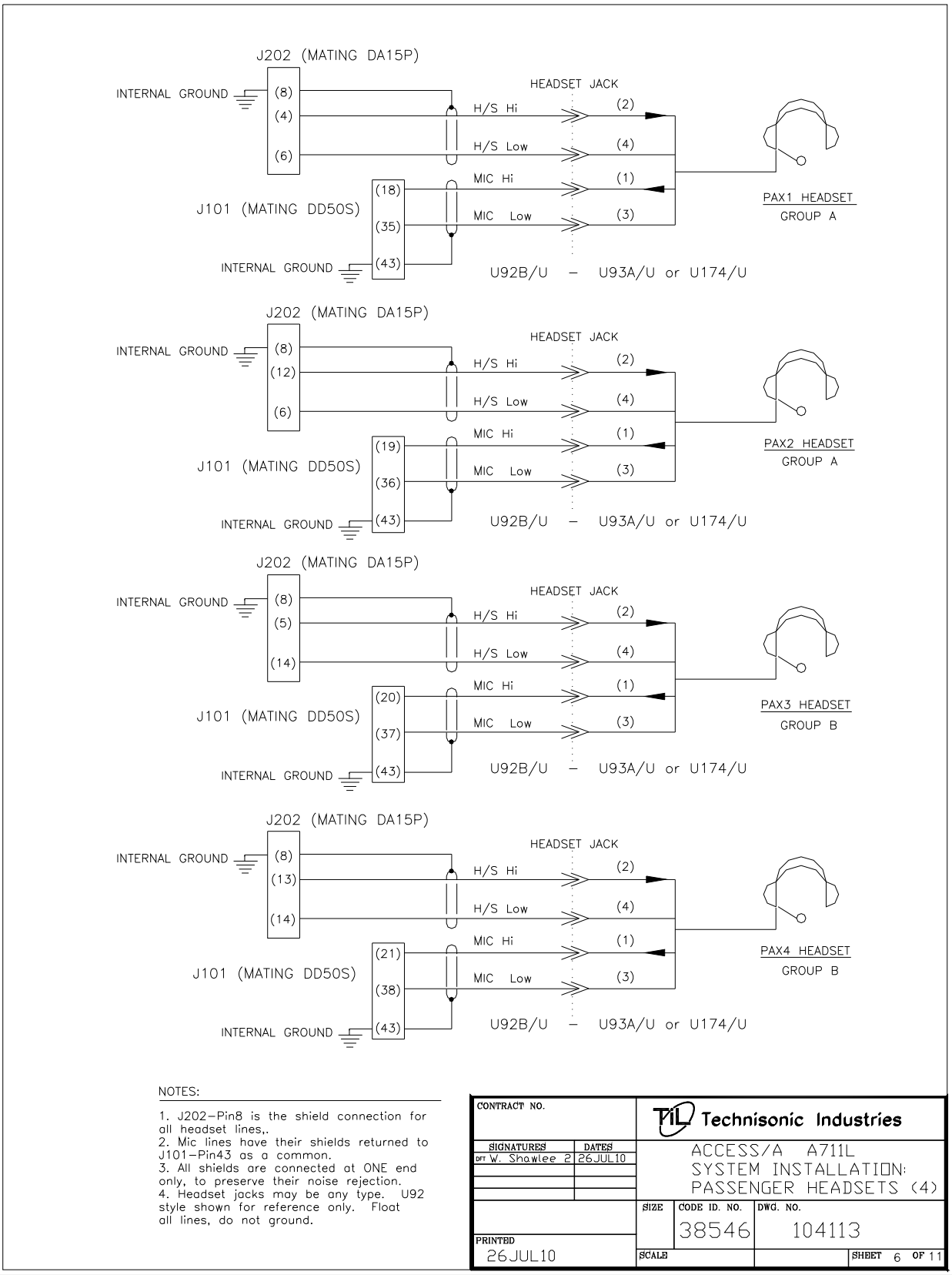


Figure 2-7 PASSENGER WIRING

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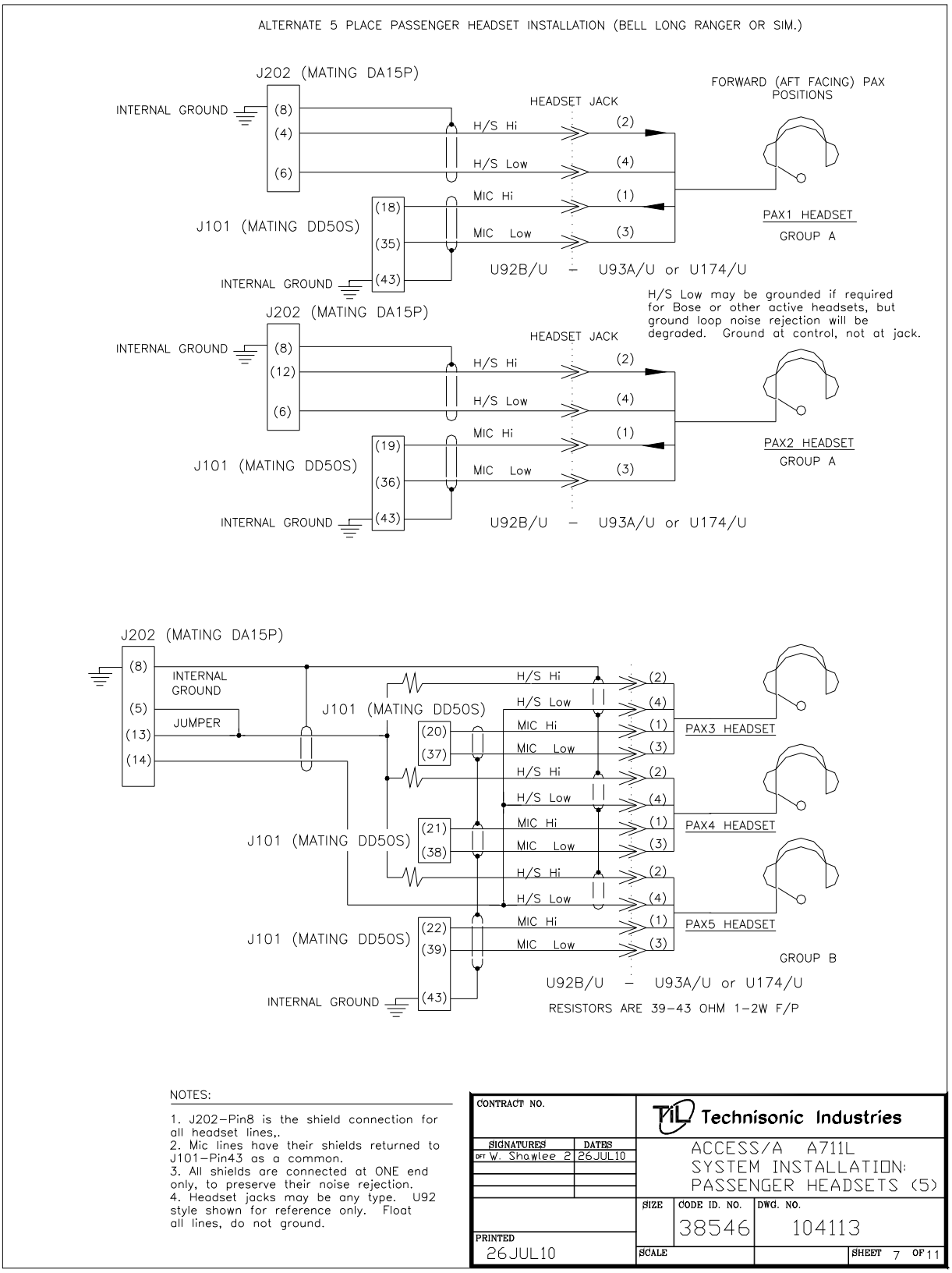


Figure 2-8 ALTERNATE PASSENGER WIRING

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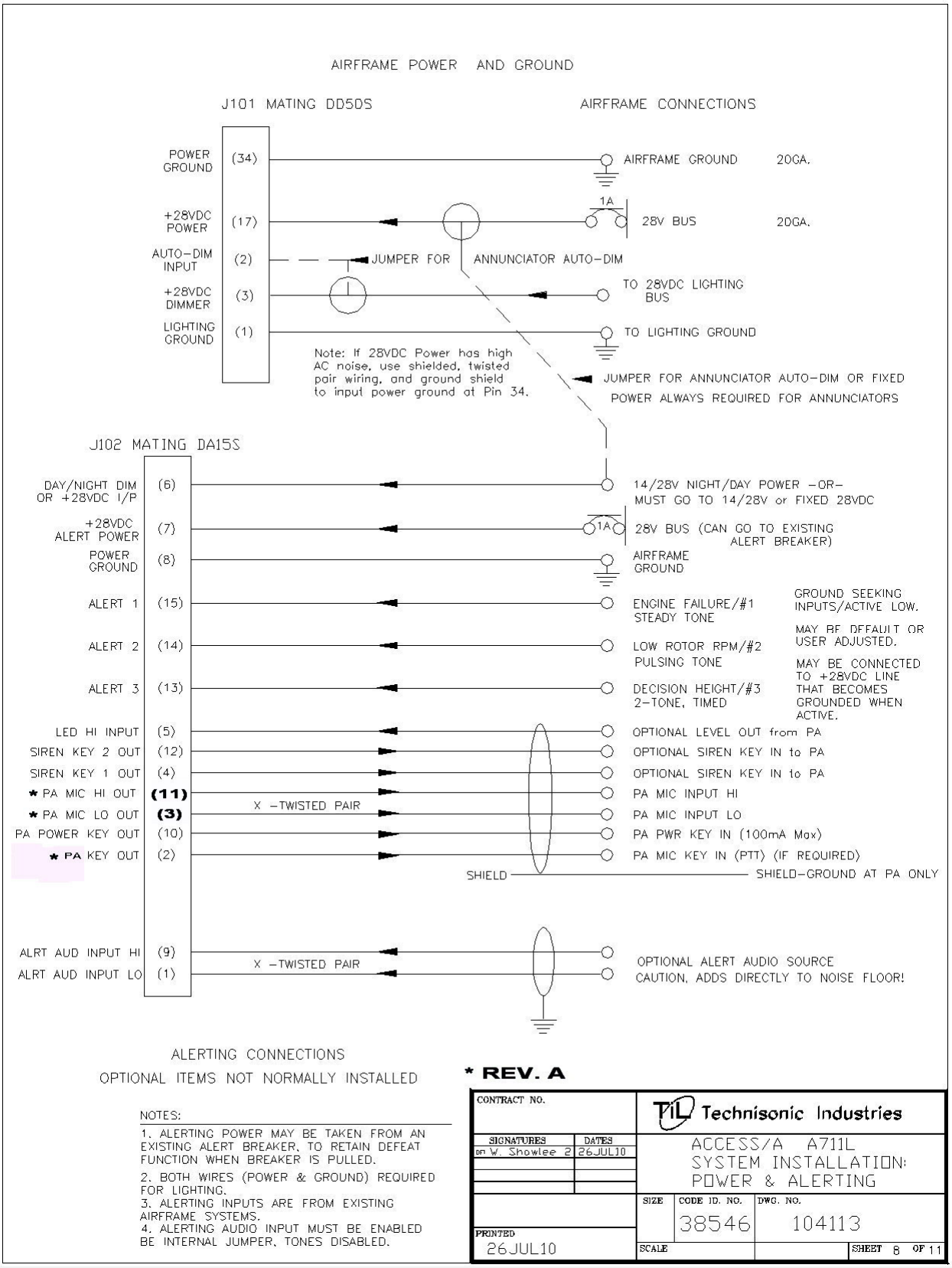


Figure 2-9 POWER & ALERTING WIRING

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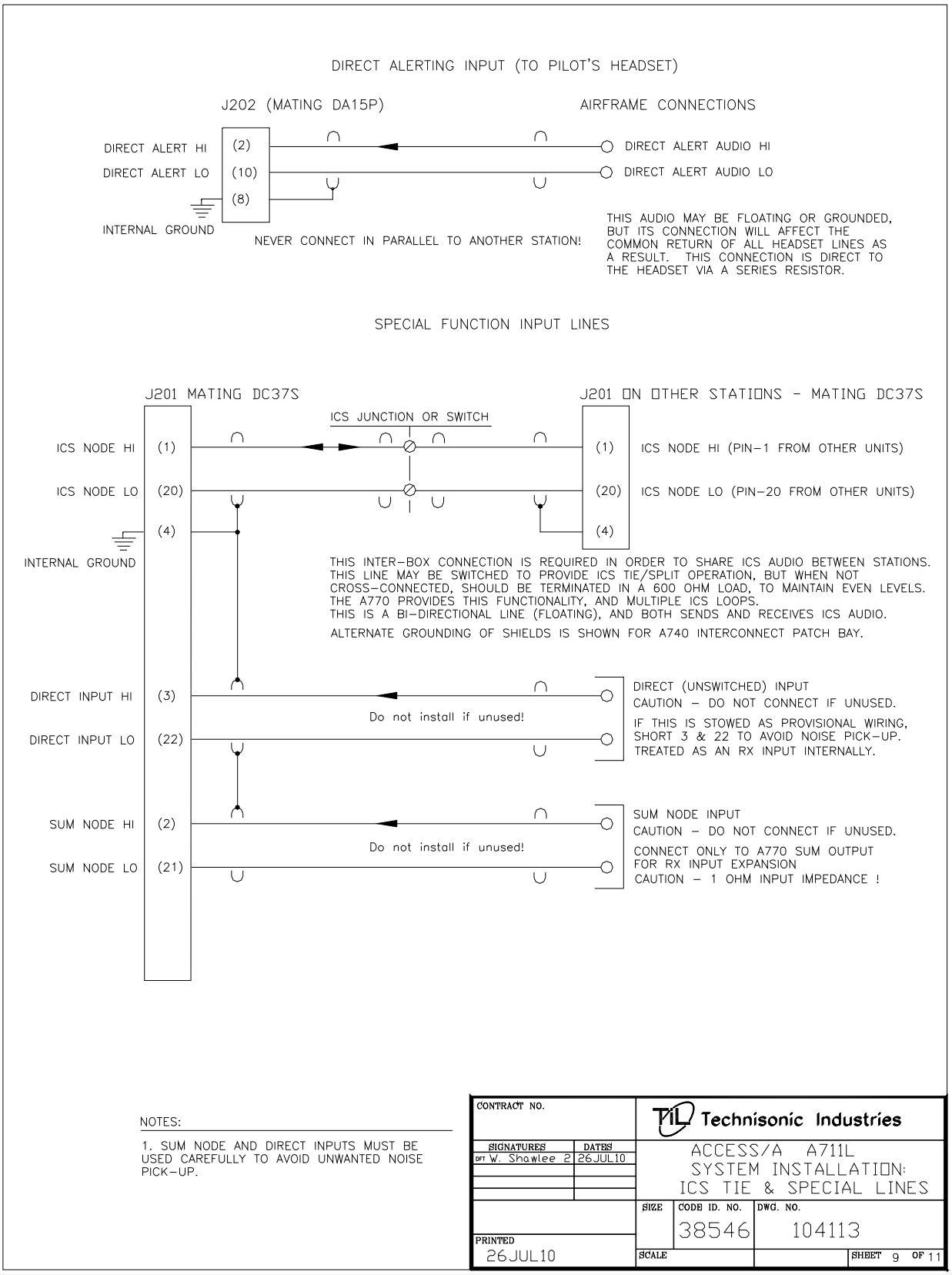


Figure 2-10 DIRECT INPUT/SPECIAL FUNCTION WIRING

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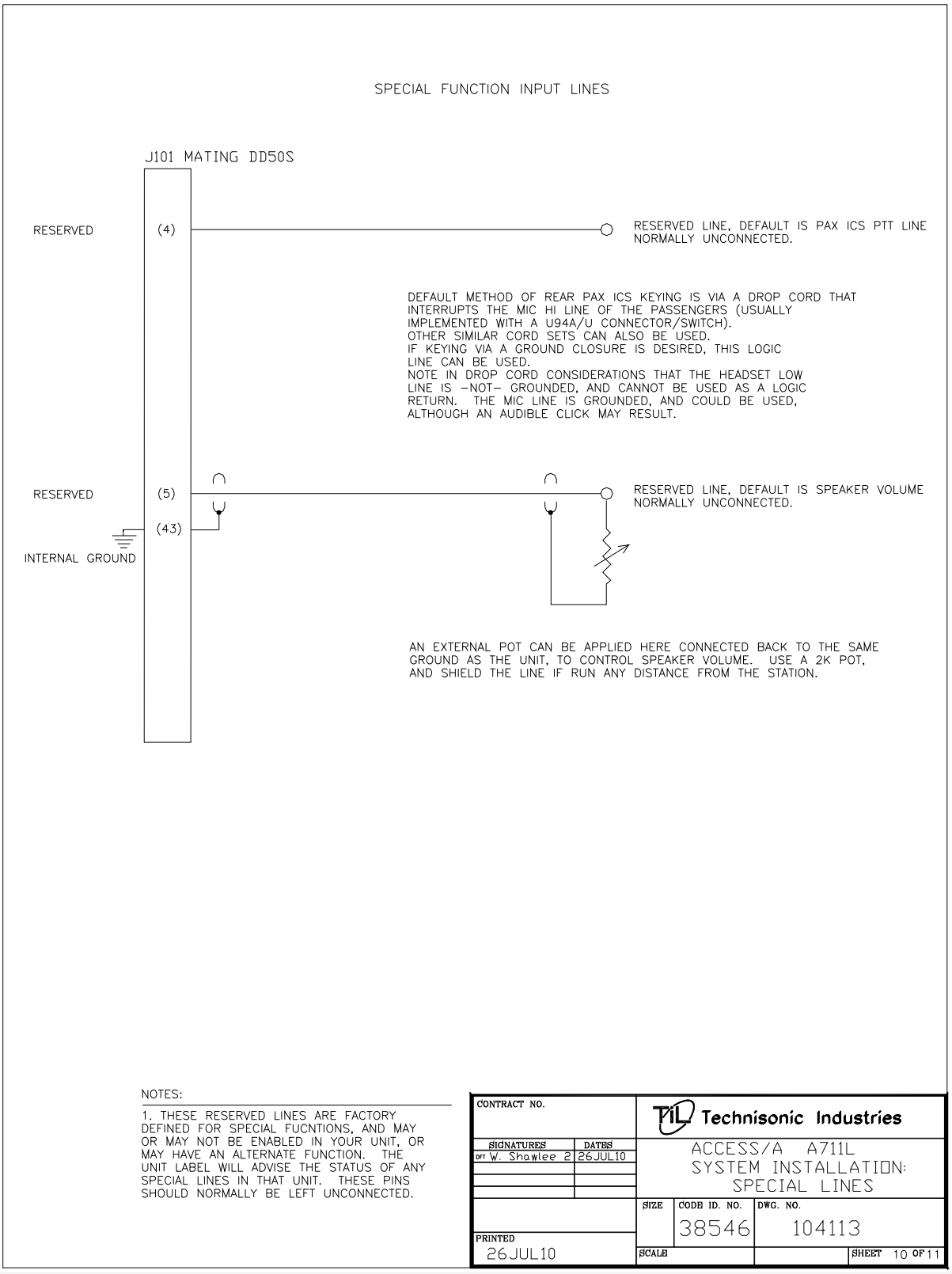


Figure 2-11 RESERVED WIRING

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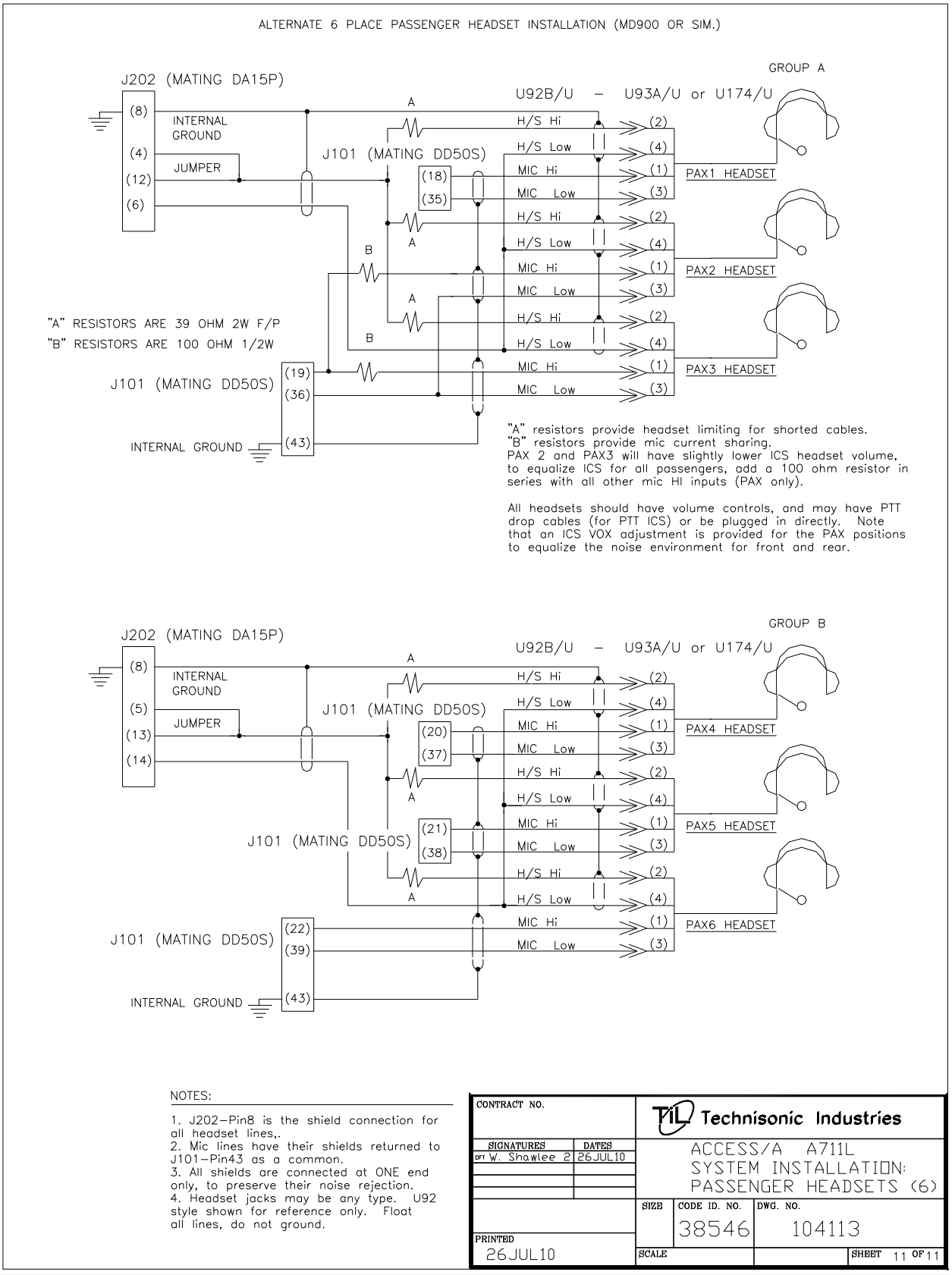


Figure 2-12 SPECIAL 6-PLACE PASSENGER WIRING

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2.4.1 PASSENGER HEADSET CONSIDERATIONS

The **A711L** has the ability to drive passenger ICS in both PTT or VOX modes, but you must consider this: ***Loose passenger headsets lying in the cabin MUST be properly accounted for.*** If the headsets are wired in directly, the loose headsets will be a continual source of intercom noise, rattling around the cabin. They have to be un-plugged when not in use, or connected via a drop cord that provides either PTT or continuous mic connection. ***This is VERY important, and must be considered during installation and operation both.*** The ***industry default is to use a drop cord of some type***, but other methods are possible, just be certain this issue has been resolved to the satisfaction of the flight crew BEFORE flight, as it cannot be corrected once airborne, without impacting flight operations.

2.5 INSTALLATION KIT - CONTENTS

The **IN-A711L** installation kit (used for **A711L** units) consists of:

1. One **50** pin **female** D-subminiature mating connector complete with crimp pins, V-locks and hood. (DD50S) **P101**
   Positronics p/n SD50F00JVLX + 50ea. FC7520D contacts or sim.

2. One **37** pin **female** D-subminiature mating connector complete with crimp pins, V-locks and hood. (DC37S) **P201**
   Positronics p/n SD37F00JVLX + 37ea. FC7520D contacts or sim.

3. One **15** pin **female** D-subminiature mating connector complete with crimp pins, Jackscrews and hood. (DA15S) **P102**
   Positronics p/n SD15F00WE2 + 15ea. FC7520D contacts or sim.

4. One **15** pin **male** D-subminiature mating connector complete with crimp pins, V-locks and hood. (DA15P) **P202**
   Positronics p/n SD15M00JVLZ (or JVLX) + 15ea. MC7520D contacts or sim.

Note: The mating connectors, except for the alerting P102 plug use a “one-hand”, tool-free Positronics V-lock assembly for ease of airframe installation and removal.

.

In addition, the following items **are packed with each A711L unit:**

1. This manual and the Operator’s Manual.

2. Warranty registration card.

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2.6 INSTALLATION - PIN LOCATIONS AND CONNECTIONS

The pin numbers and locations for the connectors located on the rear of the **A711L ACCESS/A** Audio Control are shown in the following tables.

Bottom Connector J101 DD50P **Mating Cable Connector: DD50S**
(50 pin Female)

J101 TX Connector Pin Assignments				ACCESS/A System
Com	**Mic**	**Key**	**Connection**	**Notes**
34			**Power GROUND**	Main Power Ground Line
35	**18**		PAX 1 Mic In	
36	**19**		PAX 2 Mic In	
37	**20**		PAX 3 Mic In	
38	**21**		PAX 4 Mic In	
39	**22**		PAX 5 Mic In	
		1	Lighting/Dimmer Common (GND)	Dimmer Lines
		2	+28VDC Auto-Dimmer Input (This is 5V Dim input on A710/711)	Auto-Dimmer Line, Jumper to Pin 3 for auto-dimming annunciators during night flight based on sensing the dimmer voltage.
		3	+28VDC Dimmer Input	Dimmer Line Power Input
		4	Supplemental Control Line	Default = PAX ICS PTT ●
		5	Reserved Control Line	Default = speaker volume.
40	**23**	**6**	Pilot's Mic In	
41	**24**	**7**	Co-Pilot's Mic In	
42	**25**	**8**	Hand Mic In	Emergency Hand Mic
		9	Pilot's ICS Key	Active when grounded
		26	C-Pilot's ICS Key	Active when grounded
43				Shield ground for mic lines
44	**27**	**10**	COM 7 TX Mic Out	
45	**28**	**11**	COM 6 TX Mic Out	
46	**29**	**12**	COM 5 TX Mic Out	
47	**30**	**13**	COM 4 TX Mic Out	
48	**31**	**14**	COM 3 TX Mic Out	
49	**32**	**15**	COM 2 TX Mic Out	
50	**33**	**16**	COM 1 TX Mic Out	
		17	**+28VDC Power In**	Main Power Input

● Grounding **PAX ICS PTT line** (Pin 4) will make the passenger headsets LIVE, if use of a drop cord is desired that interrupts mic line to enable PAX ICS. Alternately, this line may be keyed by the drop cord to enable ICS, or no drop cord can be used, and the front panel VOX control can guide all ICS operation.

View from solder side of MATING CABLE CONNECTOR DD50S:

1.....17
18….....33
34.....50

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Top Connector J201 DC37P

Mating Cable Connector: DC37S
(37 Pin Female)

J201 Low	J201 High	Connector Pin Assignments Connection	RX Connector Notes
20	**1**	ICS Node	ICS Tie Line Between Units
21	**2**	SUM Node Input	**For connection to A770 expansion units only**
22	**3**	Direct Input (Has Internal Level Set)	Un-switched Direct Input
4		Shield ground	Shield drain for input lines.
23	**5**	CST OUT or Music R or NAV Audio IN (supports BRIDGE OUTPUT!)	Defined at time of manufacture, only one mode supported.
24	**6**	CST IN or Music L or NAV Audio IN (supports BRIDGE OUTPUT!)	Defined at time of manufacture, only one mode supported.
25	**7**	NAV 6 RX Audio	(Un-switched)
26	**8**	NAV 5 RX Audio	(Un-switched)
27	**9**	NAV 4 RX Audio	(Un-switched)
28	**10**	NAV 3 RX Audio	(Un-switched)
29	**11**	NAV 2 RX Audio	(Un-switched)
30	**12**	NAV 1 RX Audio	(Un-switched)
31	**13**	COM 7 RX Audio	Right-hand-most TX switch
32	**14**	COM 6 RX Audio	
33	**15**	COM 5 RX Audio	
34	**16**	COM 4 RX Audio	
35	**17**	COM 3 RX Audio	
36	**18**	COM 2 RX Audio	
37	**19**	COM 1 RX Audio	Left-hand-most TX switch

Common Lines	Floating above airframe ground in ACCESS systems, but serves as common signal low for corresponding input signal lines.
Common Lines	Floating above airframe ground in ACCESS systems, and ***not connected*** to any other common line in the system.

View from solder side of DC37S MATING CONNECTOR:

1.....19
20.....37

CST (Cross Side Tone) can be connected **only between 2 stations**. **DO NOT** select the same radio locally that you are monitoring via CST on another panel, or audio distortion may occur. The sole purpose of CST is to monitor outgoing transmissions at another station on radios **YOU ARE NOT MONITORING YOURSELF**. Make this connection short, and shield exactly as directed to avoid noise. This panel position can also be defined as music or NAV inputs, fully floating from each other. Main RX board jumpers set this functionality, but because panel marking are also involved, this is normally set only at the time of manufacture.

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Top Connector J202 DA15S

Mating Cable Connector: DA15P
(15 Pin Male)

Note: this is the only male cable connector on the control

J202		Connector Pin Assignments	Headset Connector
Low	**Hi**	**Connection**	**Notes**
9	**1**	Pilot's H/S Audio	Can be set internally to either 8/20 or 150/600
10	**2**	Direct Alert Connection	High level headset direct audio (via pad) ***NEVER connect together between multiple units!***
11	**3**	Co-Pilot's H/S Audio	Group A
	4	PAX 1 H/S Audio	Group A
	5	PAX 2 H/S Audio	Group B
	12	PAX 3 H/S Audio	Group A
	13	PAX 4 H/S Audio	Group B
6		**PAX H/S Common**	
14		**PAX H/S Common**	
15	**7**	Speaker Output	8 Ohms min.
	8	Shield Ground	For connection to external floating shields

PAX Headset lines from the same **GROUP** may be connected in parallel to give more drive for a rear headset bus, but then must have ***isolation safety resistors installed*** (~47-51ohms) in series with the rear headsets for accidental short circuit isolation. See installation drawings for full details.

The Pin 2/10 Direct Input is connected directly to the pilot's H/S via a resistive pad, if multiple units use this connection to a common source, **massive cross-talk will result**. Connect ONLY ONE station in this way to a single external source

Common Lines	Floating above airframe ground in ACCESS systems, but serves as common signal low for corresponding output signal lines ***only***.
Common Lines	At Ground potential, but line must be connected here ***only, not to airframe.***

View from solder side of DA15P MATING CONNECTOR:

8.....1
15.....9

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Bottom Connector J102 DA15P **Mating Cable Connector: DA15S**
(15 Pin Female)

J102		Connector Pin Assignments	Alerting Connector
Low	High	Connection	Notes
9	1	**Alert Audio Input (Internal Jumper Selection)**	Alternate alerting input (disables tone system if jumper selected)
	2	**PA Key Output (Active Low)**	To External PA system
3	11	**PA Mic Out (Note: Rev. A)**	To External PA System
	4	Siren Key 1 Output (Active Low)	Optional Function
	5	PA LED Hi Input (Level Indicator)	Optional Function
	6	**Day/Night Annunciator Control (12/24VDC input)** **IMPORTANT, see NOTES!**	Forces TX annunciators to day or night level. If NOT used, this line MUST be connected to J101, Pin 17 (28VDC power input), or TX annunciators will NOT light.
	7	**+28VDC In**	**Alert Power (may come from existing alert breaker)**
8		**Ground (Power)**	**Power ground return connection.**
	10	**PA Power Key Output (Active Low)**	100mA ground output when PA mode is selected, can be used to activate a remote PA system.
	12	Siren Key 2 Output (Active Low)	Optional Function
	13	**Alert 3 (in) Two-Tone, Timed (Rad Alt DH)**	**Active when grounded. Accepts +28VDC.**
	14	**Alert 2 (in) Pulsing Tone (Low Rotor)**	**Active when grounded. Accepts +28VDC.**
	15	**Alert 1 (in) Steady Tone (Engine Fail)**	**Active when grounded. Accepts +28VDC.**

Optional Lines	Normally NOT enabled, installed as factory installed options only.

Alerting is tone based, with Alert 1 a steady tone, Alert 2 a pulsing tone, and Alert 3 a two-tone, timed signal. All tones are adjustable at the rear apron, to better match existing horns in the airframe. Alert 2 as priority over Alert 1, if both are activated at the same time. Alerting can be optionally installed or deleted.

Alerting has separate power and ground connections, unrelated to the rest of the audio system. Power may be taken from an existing alerting breaker, to retain the alerting defeat function by pulling one common breaker. Power consumption is very low, typically under 50mA. Alert inputs are optically coupled, and may be routed to +28VDC or ground without damage.

Rev. A corrects the reversal of pins 3 & 11, shown correctly above.

Day/Night annunciator control forces the annunciators to appropriate levels (external 12/24VDC), it must be tied to +28V if not used in this way, or if auto-dimming via J101 is used.

View from solder side of DB15S MATING CONNECTOR:

1.....8
9.....15

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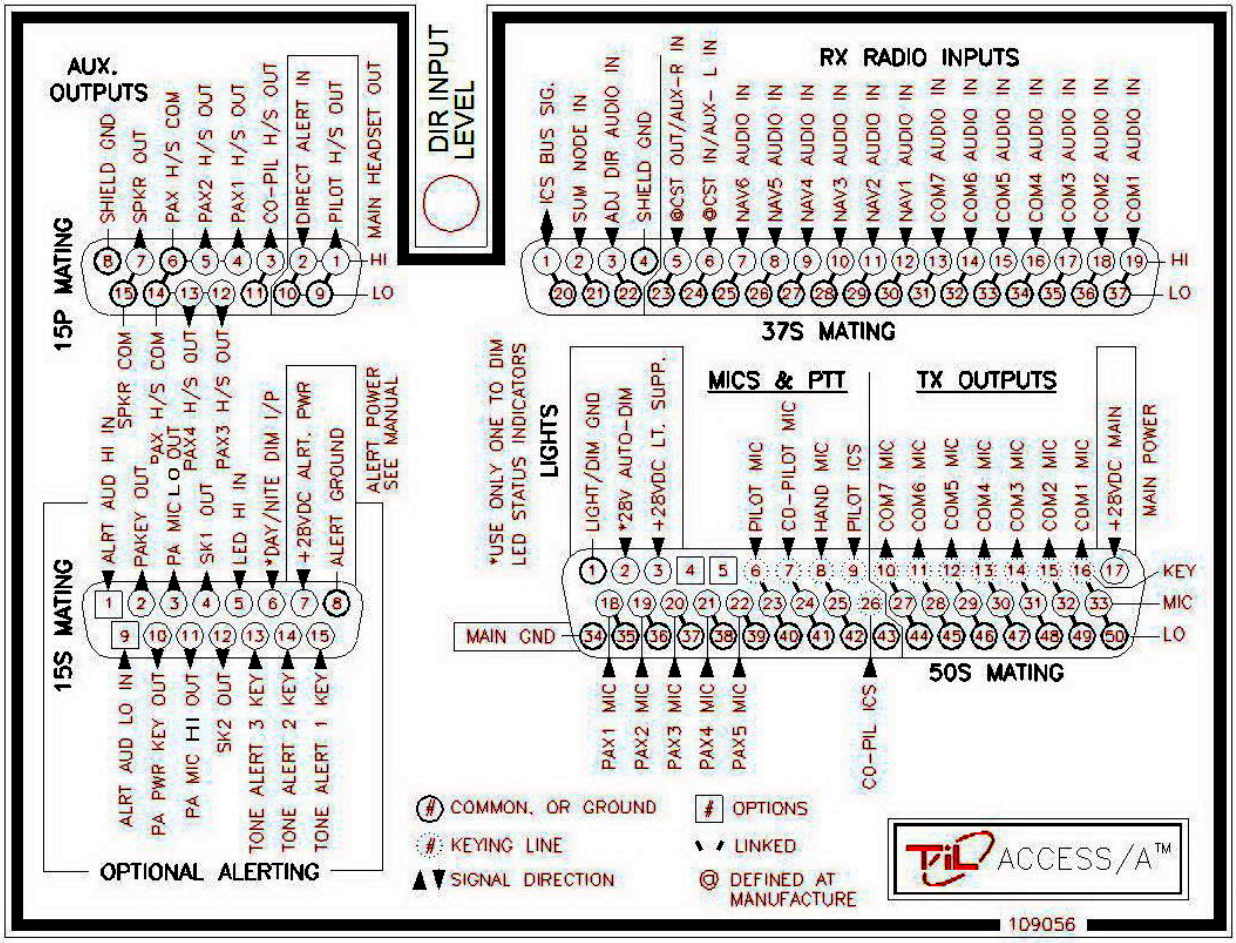


Figure 2-13 Full A711L Connector Map (view from mating connector wiring side)

2.7 ☑ HEADPHONE INSTALLATION

The **A711L ACCESS/A** Audio Controls are intended for use with industry standard 150/600 ohm headphones. There is also provision for connection to an 8 ohm (minimum impedance) speaker, for a supplemental cabin speaker output. The pilot's headset (only) may also be strapped internally for a standard low impedance headset (8-20 ohms) at the same power level.

In all cases, the headset lines should be run as ***shielded, twisted pairs***, to avoid contamination (and resulting cross-talk) of companion low level mic lines or audio input lines. Failure to follow this wiring guideline will result in unwanted cross-talk, and phantom audio that will appear to be transmit or intercom related.

The use of high quality headsets and "carbon-equivalent" boom microphones, such as David Clark or Bose is strongly recommended. Mixed headset impedances within the same ship will give differing volume levels at the same **A711L** control settings. The use of ***headsets with individual volume controls is very useful for passengers*** to permit level adjustment suitable to each position, due to differing headsets and the inevitable different hearing capability of individual users.

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2.8 ☑ MICROPHONE INSTALLATION

All microphone connections to the **A711L** must be done with ***shielded cables***. The inputs are intended for use with standard “carbon-equivalent” or amplified dynamic Microphones (such as the D/C M1, M4 M7, etc.). ***Shielded, twisted pair*** routing is strongly preferred for lowest noise pick-up, but single conductor shielded wiring generally gives adequate results in non-critical or single box installations, although noise floor and cross-talk will increase.

2.9 ☑ PTT CONNECTIONS

The Pilot, Co-pilot and hand microphones require a PTT (Push To Talk) button or switch to key the transceivers as required. If a Hand-held microphone is used, tie the PTT button to the appropriate key line. If a boom microphone is incorporated into the headset, an external switch, such as the cyclic switch or yoke switch, will be required to key the transmitter. PTT lines should go directly to ground to activate the desired key function.

2.10 MAIN POWER +28VDC

The main power +28VDC (±20%) is connected to Pin **17** of the 50 pin (lower) "D" connector, and optionally to J102 Pin 6 as well, for annunciator control.

As previously indicated, this connection should be made with at least **#22 AWG** wire, with **#20 preferred**. If from a very noisy source, with high levels of parasitic AC, shielding may improve rejection of this coupled AC into other low level audio lines.

2.11 ☑ BACKLIGHTING POWER +28VDC

The backlighting power for the front panel of the **A711L** is supplied via pins **1 & 2 (and optionally pin 3 for annunciator auto-dimming)** of the 50 pin (lower) "D" connector. Unless ordered and indicated otherwise on the rear of the **ACCESS/A A711L**, the unit is shipped with the +28VDC normal lighting backlighting option. Note that there is a **dedicated lighting ground pin**, **which MUST be connected for the lighting to work.** Lighting is isolated from other circuits in the system for **noise reduction reasons**. Backlighting can be either normal (cool white) or NVG/ANVIS compatible (green).

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2.12 ☑ ANNUNCIATOR DIMMING

The lighted annunciators (Radio Selected, TX status) can be operated in three ways. First, they can be run at their **fixed intensity** at all times, this is done by jumpering J102 Pin 6 (Day/Night Dim I/P) to J101 Pin 17 (28V Input Power). No connection is then made to J101 Pin 2 (Auto Dim Input).

Second, they can be made to **auto-dim** during night flight (by sensing the voltage range of the regular dimmer, and shifting to low intensity for night flight). This is done by jumpering J101 Pin 2 (Auto Dim Input) to J101 Pin 3 (28V Dim Input), and jumpering J102 Pin 6 (Day/Night Dim I/P) to J101 Pin 17 (28V Input Power).

Finally, they can be **forced externally** to shift bright or dim by applying an external 14/28VDC day/night voltage to J102 Pin 6 (Day/Night Dim I/P). No connection is then made to J101 Pin 2 (Auto Dim Input).

Voltage (14 or 28VDC) must always be applied to J102 Pin 6 (Day/Night Dim I/P), or the annunciators **WILL NOT LIGHT**.

2.13 GROUND

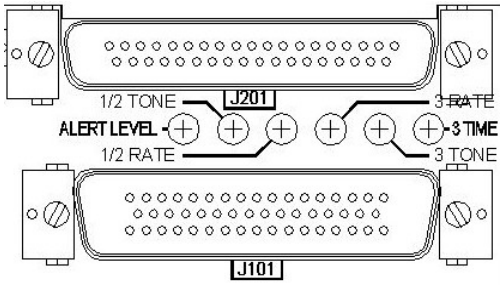
The A711L Audio Control is designed for full Signal Ground Isolation from the Airframe. This is necessary in many cases where the Airframe Ground causes significant noise in the Audio system.

Main ground (power return) to the **A711L** is on pin **34** of the 50 pin "D" connector. All other groups of audio lines have their own “common” lines, which float above the airframe ground, to provide signal isolation. These common lines MUST be connected to the source audio low connection, or no signal flow will result, except for stray capacitive leakage.

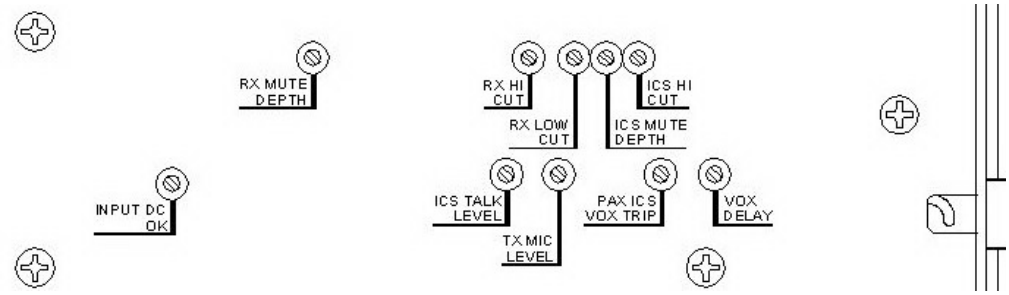
2.14 STORAGE

When not in use, Store the **A711L** in the original Anti-Static bag if possible, and in a non-Humid place. Optimum storage temperatures for the best shelf life should not exceed +35°C, or be less than -10°C.

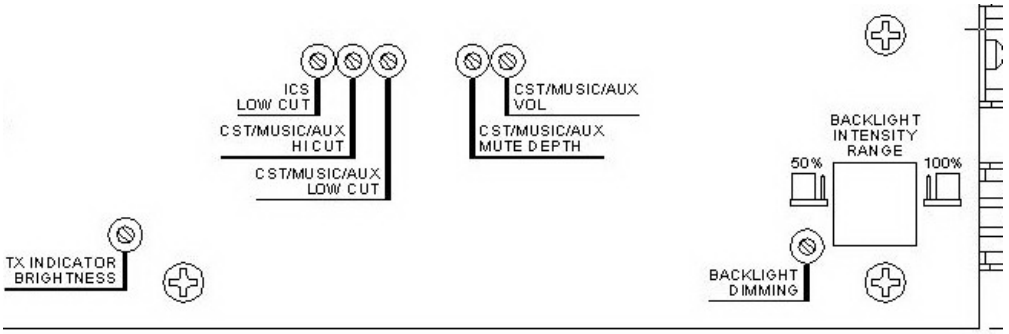
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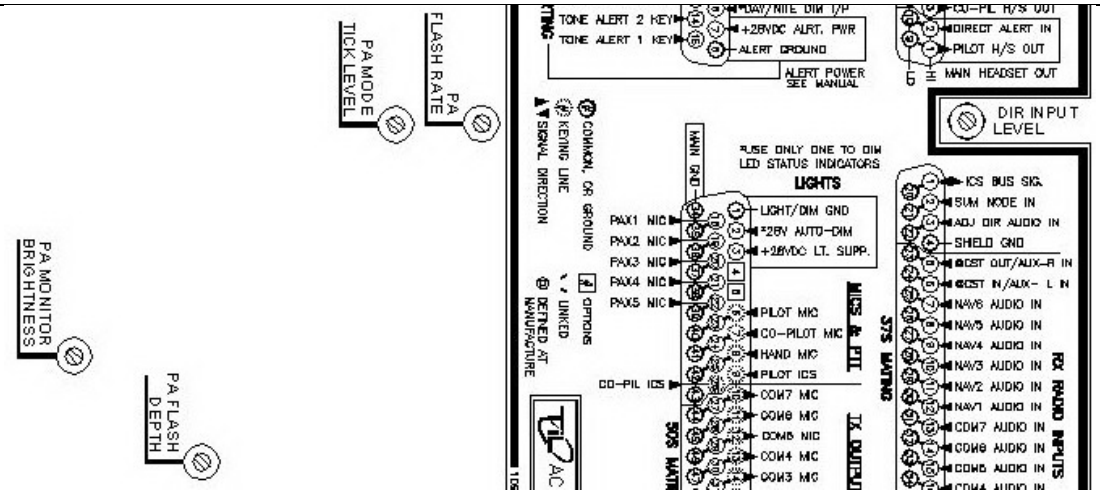
Rear Tone Alerts Adjustments



Side RX/TX Adjustments



Side Lighting/CST/Aux Adjustments



Top PA Adjustments

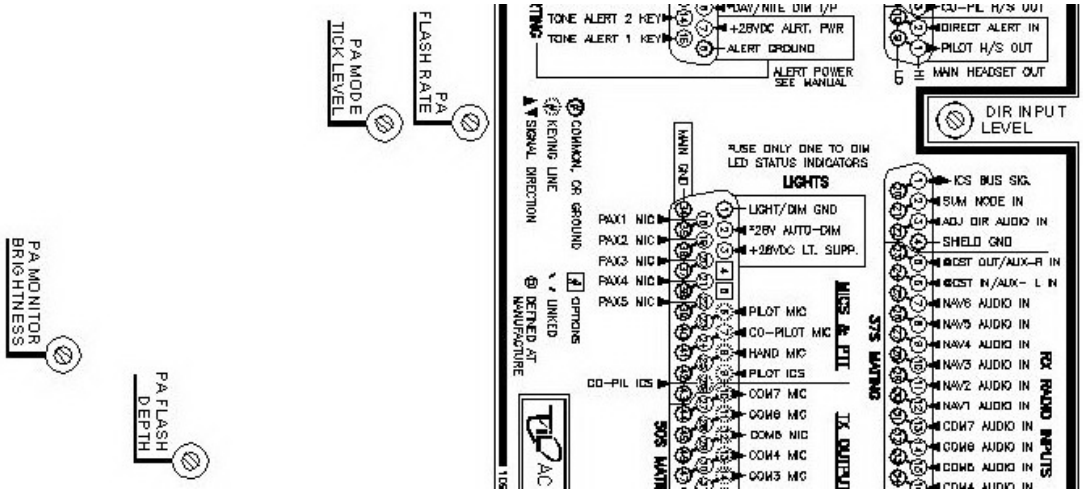
2.14 POST-INSTALLATION ADJUSTMENT LOCATIONS

2.15 POST-INSTALLATION ADJUSTMENTS

After installation, the **A711L** may require adjustment of some functions to compensate for airframe and equipment specific issues, and to suit user tastes. Locations of these adjustments are as shown in section 2.14. All are 20-turn miniature trimpots, except as noted. "MUSIC" input may be for any entertainment audio feed, such as CD, tuner, etc.

Note, back adjustments (alerting) are NOT normally field adjusted, unless required. The 37 Pin connector (not required for this test) above these adjustments may be removed to facilitate the adjustment of these alerting pots. Be extremely careful of any adjustments to these settings, as incorrect levels will be highly problematic in the airframe. These are normally bench adjustments.

The unit adjustments are as follows:

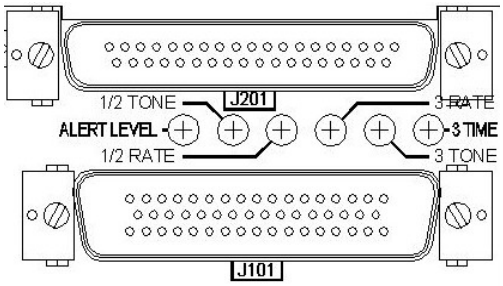


TOP – PA Adjustments –Direct Level

Adjustment Name	Location	Procedure/purpose	Notes
Direct Input Level	Top	Adjusts "Direct" input J210-3/22, an un-switched input, set as required. Often not used in installation.	Preset, Set to desired level, if required
PA Monitor Brightness	Top	OPTIONAL, sets PA level LED.*	Set with remote PA to give brightness desired for full output
PA Flash Depth	Top	Sets the dim/bright ratio of the green PA mode annunciator LED. *	Select PA, and set to suit. This is the visual warning of PA operation.
PA Mode Tick Level	Top	Selected by internal jumper, can send an audible tick at the flash rate during PA operation for pilot warning.	Select PA, and set to suit. Optional feature, internal jumper must be set to enable.
PA Flash Rate	Top	Sets the green PA mode annunciator flash rate. *	Select PA, and set to suit. This is the visual warning of PA operation.

- (*) Not altered by the external annunciator control.

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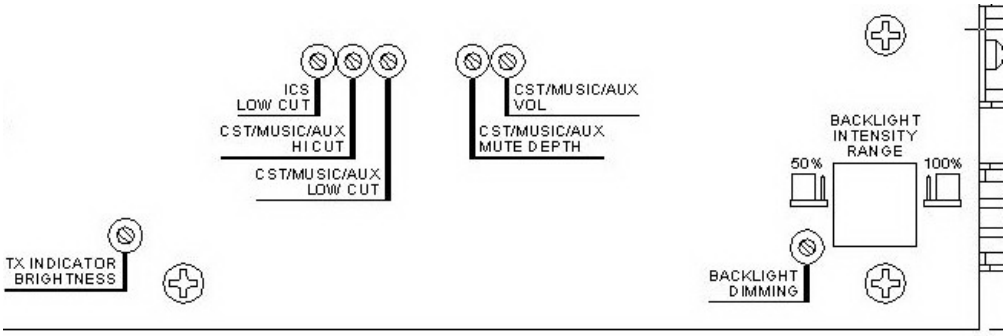
J201 (above) may be removed to make these adjustments

Back - Alerting Adjustments

Adjustment Name	Location	Procedure/purpose	Notes
Alert Level	Back	Adj. for comfortable alert level, controls both direct input (option) and tone generator	☑ Too sensitive will increase noise floor. Not normally a field setting.
1 / 2 Tone	Back	Adj. for closest Alert 1 and Alert 2 tone match to existing alert horn sound.	☑ Not normally a field setting.
1 / 2 Rate	Back	Adj. for closest Alert 2 pulse rate match to existing alert horn sound.	☑ Not normally a field setting.
3 Tone	Back	Adj. for desired Alert 3 tone range.	☑ Not normally a field setting.
3 Rate	Back	Adj. for desired Alert 3 pulse rate.	☑ Not normally a field setting.
3 Time	Back	Adj. for desired Alert 3 activation interval.	☑ Not normally a field setting.

Testing or adjusting alerting functions requires airframe conditions to be set up to trigger the desired alerts, never perform adjustments in flight.

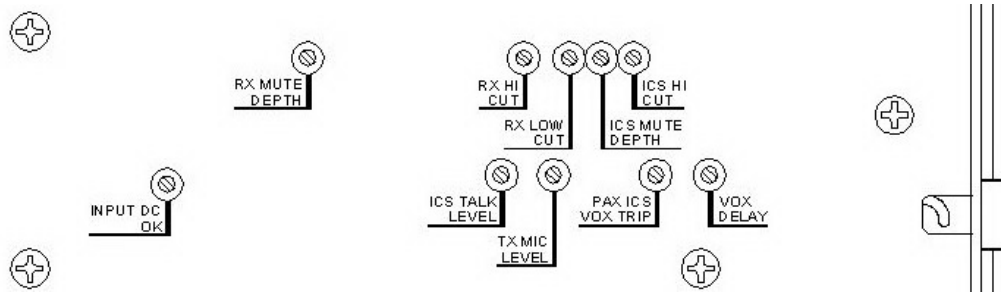
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Side Lighting/CST/Aux Adjustments

Adjustment Name	Location	Procedure/purpose	Notes
ICS Low Cut	R/H Side	Sets low frequency cut-off (BASS) of ICS audio. Useful for removing very high levels of cabin low frequency noise on the intercom.	Not normally a field setting.
CST/MUSIC/AUX Hi Cut	R/H Side	Sets high frequency cut-off (TREBLE) of CST/MUSIC/AUX audio.	Preset, set to desired level, if required.
CST/MUSIC/AUX Low Cut	R/H Side	Sets low frequency cut-off (BASS) of CST/MUSIC/AUX audio.	Preset, set to desired level, if required
CST/MUSIC/AUX Mute Depth	R/H Side	Sets muting level of CST/MUSIC/AUX audio during ICS or TX operations. May be muted completely OFF, or set to a lower level during these operations.	Preset to OFF, Set to other desired level, if required
CST/MUSIC/AUX Volume	R/H Side	Sets sensitivity of the CST/MUSIC/AUX audio input channels. Note that this input is NOT set by the front panel RX control, but IS controlled by the dedicated CST/MUSIC/AUX level control.	Preset, Set to desired level, if required for specific system. Do not make too sensitive, or noise floor will suffer
Backlight Dimming	R/H Side	Allows dynamic range and maximum brightness of the front panel backlight intensity to be set.	Adjust panel dimmer and set to suit.
Backlight Intensity Range	R/H Side	Allows large adjustment of front panel backlight intensity to be set, 100% is normal for regular lighting, 50% is normal for NVG panels.	Normally preset depending on backlight type, but can be field changed.
TX Indicator Brightness	R/H Side	This controls the intensity shift level if all green TX annunciation is jumper selected (NVG default), has no effect with normal mode lighting.	Preset, set to desired level, if required. Adjust for desired annunciator intensity change during transmit.

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Side RX/TX Adjustments

Adjustment Name	Location	Procedure/purpose	Notes
RX Mute Depth	L/H Side Upper	Sets mute level of RX audio during TX operations. (Sidetone)	Preset for 6dB at mid-volume control. Set to other desired level, if required
RX Hi Cut	L/H Side Upper	Sets high frequency cut-off (TREBLE) of RX audio.	Preset, Set to desired level, if required
RX Low Cut	L/H Side Upper	Sets low frequency cut-off (BASS) of RX audio.	Preset, Set to desired level, if required
ICS Mute Depth	L/H Side Upper	Sets Mute depth of ICS audio during TX operations	Preset, Set to desired level, if required
ICS Hi Cut	L/H Side Upper	Sets hi frequency cut-off (TREBLE) of ICS audio. Useful for removing very high levels of cabin high frequency noise on the intercom.	Preset, Set to desired level, if required
ICS Talk Level	L/H Side Lower	Sets ICS talk level, and audio exported to other units in the airframe. Normally set to mid-position.	☑ Single -turn pot. Should be set to lowest level that is acceptable, to reduce ICS noise. Normally set to **mid-position.**
TX Mic Level	L/H Side Lower	Sets TX Mic level, and audio exported to transceivers in the airframe. Normally set to mid-position.	☑ Single -turn pot. Should be set to lowest level that is acceptable, to reduce TX mic noise. Normally set to **mid-position.** Should be similar to level from pilot's Mic output during emergency operation.
PAX VOX Trip	L/H Side Lower	Sets VOX offset for passengers. Allows for differing Mics or ambient conditions. PAX VOX tracks front panel VOX control, but is offset by this adjustment, which can be more or less sensitive. Normally set to mid-position.	☑ Single -turn pot. Should be set to **mid-position** unless change required.
VOX Delay	L/H Side Lower	Sets time dwell or delay of VOX circuit, once activated. Too short will result in choppy VOX operation, too long will allow VOX to remain open when no voice is present.	☑ Single -turn pot. Should be set to **mid-position** unless change required.

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Unit modifications that can be set in the field during installation:

Internal, removable jumpers may be set for the following items (**DEFAULT is BOLD**):

Main RX Board

PILOT HEADSET Impedance:	**150/600** or 8/20 ohms
SPEAKER AUDIO:	**RX Audio ON**/OFF **CST/MUSIC/AUX (TAPE) Audio ON**/OFF
HEADSET AUDIO:	**CST/MUSIC/AUX (TAPE) Audio ON**/OFF
RX VOL MIIN:	**Set to 5%** or Set to 0%
CST/NAV/MUSIC Function	**Jumpered CST**

Internal, removable jumpers may be set for the following items (**DEFAULT is BOLD**):

Mic Processor Board

PAL OPT 1:	**Jumpered**
PAL OPT 2:	**Jumpered**
OPT 3 (Pil. TX Muting)	**Jumpered**

Internal, removable jumpers may be set for the following items (**DEFAULT is BOLD**):

Main TX Board

Backlight Range 50/100%	**Jumpered 100%**
TX Annunciator RED/GREEN	**Jumpered RED (Green for NVG)**

Internal, removable jumpers may be set for the following items (**DEFAULT is BOLD**):

POT Board

PA Audio Tick (ON/OFF)	**Jumpered OFF**

Refer to the Service Manual for locations and further details.

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2.16 Product Warranty Terms

Technisonic Industries Limited
240 Traders Blvd., Mississauga, ON Canada L4Z 1W7
Tel: (905) 890-2113 Fax: (905) 890-5338

IMPORTANT!
PRODUCT WARRANTY

All communication equipment manufactured by Technisonic Industries Limited is warranted to be free of defects in Material or Workmanship under normal use for a period of one year from Date of Purchase by the end user.

Warranty will only apply to equipment installed by a factory approved and/or authorized facility in accordance with Technisonic published installation instructions. Equipment falling under the following is not covered by warranty:

- equipment that has been repaired or altered in any way as to affect performance,
- equipment that has been subject to improper installation,
- equipment that has been used for purposes other than intended,
- equipment that has been involved in any accident, fire, flood, immersion or subject to any other abuse.

Expressly excluded from this warranty are changes or charges relating to the removal and re-installation of equipment from the aircraft. Technisonic will repair or replace (at Technisonic's discretion) any defective transceiver or audio system (or part thereof) found to be faulty during the Warranty Period.

Faulty equipment must be returned to Technisonic (or its authorized Warranty Depot) with transportation charges prepaid. Repaired (or replacement) equipment will be returned to the customer with collect freight charges. If the failure of a transceiver occurs within the first 30 days of service, Technisonic will return the repaired or replacement equipment prepaid.

Technisonic reserves the right to make changes in design, or additions to, or improvements in its products without obligation to install such additions and improvements in equipment previously manufactured. This Warranty is in lieu of any and all other warranties expressed or implied, including any warranty of merchantability or fitness, and of all other obligations or liabilities on the part of Technisonic.

This Warranty shall not be transferable or assignable to any other persons, firms or corporations.

For warranty registration please complete the on-line Warranty Registration Form found at www.til.ca.